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Effectiviteitsmeting in de detailhandel

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Document Version

Publisher's PDF, also known as Version of record

Publication date:

1984

[Link to publication in University of Groningen/UMCG research database](#)

Citation for published version (APA):

Goor, A. R. V. (1984). Effectiviteitsmeting in de detailhandel. Groningen: Stenfert Kroese.

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Summary

Studies of demand models in which measures of demand are related to marketing decision variables and environmental variables are numerous. In most studies the demand refers to the demand of a final consumer good whilst the decision variables refer to the marketing instruments of a producer. This means that retailers have not been prominent users of mathematical marketing models and statistical techniques. In this study we describe a model to assist retail management in determining the effectiveness of marketing decision variables on a performance measure. The parameters of the model are determined by a cross-sectional analysis. To this end data have been collected from 802 food retail outlets in the Northern part of the Netherlands. The outlets are affiliated with 14 retail organizations. The data cover the 13-th weekly period in 1978.

Studies of store location models are examples of mathematical modelling in retailing. Given that locational decisions are not readily reversible, various models for determining optimal store location have been proposed. Examples of such models include subjective, Analog, Gravity and Multiplicative Competitive Interaction (MCI) models. In a survey in chapter 1 we discuss these models. In most studies the dependent variable is the probability that a customer at a certain location in a trading area will shop at a specified retail facility. The performance is usually explained by environmental variables rather than instrumental variables. The goodness of fit seems to be unsatisfactory.

To overcome these problems we specify a model in chapter 2 which bears the feature that the total final demand of a (food) retail outlet is explained by all relevant marketing decision variables of a retailer/retail organization, and all relevant environmental variables. By the total final demand we mean the demand of all products which are bought at a retail outlet. The total final demand of a retail outlet can be related directly to decision and environmental variables. It is, however, also possible to model the final demand indirectly by first explaining the total demand of all retailers and the market share of the retail outlet, and then multiplying them. Modelling the retailers' total final demand indirectly is preferable for a number of reasons.

In our study the following product groups are considered: fresh fruits and vegetables, meat and meat products, bread, groceries, milk and dairy products, beer and soft drinks, chemist's products and non foods. In chapter 2 we make a first analysis of the sampled data on instrumental variables with respect to these product groups.

In chapter 3 we specify three types of multiplicative market share models. Parameters have been estimated by O.L.S. and G.L.S. methods. Performing a Chow-test justifies the conclusion that pooling the observations for the 14 retail organizations is not permitted. For the explanation of the fluctuations in market share, the width of the assortment and the width of the product group offered in the retail outlet, are significant variables. The depth of the product group, retail advertising and the share of the sales of private labels seem to be less important explaining variables.

In chapter 4 we specify three regional market share models. In these models we account for the competition of retail outlets within a regional trading area. Parameter estimation (O.L.S. and G.L.S.) has been performed for 9 trading areas and 7 product groups. Pooling is only permitted in groceries.

Again, the width of the assortment and the width of the product groups prove to be significant factors. The response parameter of the price variable is influenced by price effects and economies of scale.

A model for the total final demand of all retailers is specified in chapter 5. Parameter estimation for all product groups show that purchasing power (per capita sales multiplied with the number of inhabitants) is a significant factor in five product groups; the width of the assortment in a trading area is significant in all product groups, whilst the price variable has a significant response parameter in three product groups, but is influenced by economies of scale.

In chapter 6 the validation is performed for the total model. A number of validation measures is calculated for the analysis sample and the validation sample. Validation measures such as Theil's inequality coefficient and the Janus-quotient show us that the performance of the total model is better for groceries, milk and dairy products, beer and soft drinks, chemist's products and non foods than for fresh fruits and vegetables, meat and meat products and bread. This can be caused by heterogeneity in the observations.

In chapter 7, finally, we discuss the implementation of the model. We conclude our model meets the criteria simple, complete and adaptive. However, the model is not robust. With a number of examples we show the possibilities of our model for retail organizations, for their cooperation at branch level and for government. Where other studies are restricted to one product or product group in food retailing, our study encloses the total assortment of an outlet in food retailing. An extensive sample enables this.

As a final conclusion we stress that our study proves that market share models and a cross section analysis make it possible to measure the effectiveness of instrumental variables in food retailing.